111. A method comprising the step of simultaneously providing a communication channel having a data rate of at least 9.6 kilobits per second to each of at least 100 mobile units traveling at a speed greater than 45 kilometers per hour within a geographic area less than 1 square kilometer.

112. A method comprising the step of simultaneously providing a communication channel having a data rate of at least 144 kilobits to each of at least 6 mobile units traveling at a speed greater than 45 kilometers per hour along a roadway wherein a longest distance between any two of the 6 mobile units is less than 60 meters.

REMARKS

This paper is responsive to an Office Action dated September 13, 2002. Claims 30 -112 are pending. Claims 63-88 and 97-112 are allowed. Applicant has amended claims 37, 39-43, 45-48, 55, 57-60, 63, 65-69, 75, 77-80, 84, 97, 99-102 and 108.

The Examiner objected to claims 84 and 108 because of informalities. Applicant has amended claims 84 and 108 in accordance with the Examiners suggestions and respectfully submits that the claims are allowable.

The Examiner rejected claims 37 and 43 under 35 U.S.C. 112 second paragraph as being indefinite for failing to particularly and distinctly claim the subject matter which the applicant regards as the invention. Applicant has amended claims 37 and 43 to more clearly define the invention and respectfully submits claims 37 and 43 meet the requirements of 35 U.S.C. 112, second paragraph.

The Examiner rejected claims 37 and 43 under 35 USC 102(b) as being anticipated by Mears et al. ("Mears"), US patent No. 4,539,706

A rejection of a claim for anticipation requires that a single anticipating reference include, within its four corners, all of the elements, limitations, and relationships therebetween of the

rejected claim. Applicant respectfully submits that Mears does not teach each and every element recited in each of claims 37 and 43.

Claims 37 and 43 each recite an "apparatus adapted to move in accordance with a motion of a mobile unit". Applicant respectfully submits that Mears does not teach this element. The mobile vehicular radio repeater in Mears is not adapted to move in accordance with the motion of the portable radio. Mears discusses mobile vehicular radio repeaters which can be located in a police car or fire truck that repeat communications from a portable radio held by a person on foot to a central station such as police or fire station. Column 1, lines 19-30. Nowhere in Mears is there a discussion of mobile vehicular radio repeaters that "move in accordance with a motion of a mobile unit". Mears, on the contrary, suggests that the mobile vehicular radio repeater does not move in accordance with the motion of any portable radio. Mears solves the problem of the lack of acknowledgement of a successful transmission from a portable radio. In providing an example of a situation that may arise where the operator of portable radio may not be aware of a successful transmission, Mears states (at Column 2, Lines 14-16): "For example, during the message transmission he may have inadvertently moved out of range of the vehicular repeater." This statement suggests that the mobile vehicular radio repeater does not move in accordance with the motion of the portable radio. Accordingly, Mears does not teach each and every element of either claim 37 or claim 43 and applicant respectfully submits that these claims are allowable.

Regarding claims 38-42, these claims depend from claim 37 which applicant respectfully submits is allowable. Accordingly, claims 38-42 are allowable as depending from an allowable base claim.

Regarding claims 43-48, these claims depend from claim 42 which applicant respectfully submits is allowable. Accordingly, claims 43-48 are allowable as depending from an allowable base claim.

The Examiner rejected claims 54-56 and 58 under 35 USC 102(b) as being anticipated by Charas et al. US Patent No. 5,404,570 ("Charas"). Applicant respectfully submits that Charas does not disclose every element of any one of claims 54-56 or 58 and that these claims are allowable over the art cited.

Claims 54-56, and 58 recite a movable base station adapted to have a motion relative to a fixed port along a predetermined path and in accordance with an anticipated motion of a mobile unit "wherein the motion of the movable base station is independently controllable to the motion of the mobile unit". Applicant submits Charas does not teach this element. Charas describes repeater systems for providing radio coverage in closed environments where a mobile base station is located within a moving vehicle such as train car traveling through a tunnel. Mobile units within the train car can communicate with an external base station with use of the repeater system. The mobile base station in Charas, however, does not have a motion that is independently controllable to the motion of the mobile units. Any change in speed or motion of the mobile base station results in a change in speed or motion of the mobile units within the vehicle. Therefore, the motion of the mobile base station can not be controlled independently from the motion of the mobile units. Accordingly, applicant respectfully submits that Charas does not describe every limitation of any of claims 54-56 or 58 and that these claims are allowable.

As amended, claim 55 further recites a movable base station "wherein the first communication link and the second communication are established within a frequency band having a lower limit greater than or equal to 300 megahertz". Applicant submits that Charas does not show this element and, on the contrary, teaches away from the claimed invention by specifically describing a system where communications between the mobile base station and a cable be performed at a "low frequency . . .in the range of 30 to 300 megahertz." Column 3, lines 17-18. (Also see Column 3, lines 61-65). Charas describes a system that overcomes the problems encountered in communicating with mobile units in a closed environment, Charas teaches to convert the signals to low frequency signals that can propagate through the closed environment. Therefore, Charas does not teach to establish a second communication link between the movable base station and the fixed port "within a frequency band having a lower limit greater than or equal to 300 megahertz" as recited in claim 55.

Claim 56 further recites a movable base station "wherein the frequency band has a lower limit of 300 megahertz." Applicant respectfully submits that Charas does not teach this element. As explained above in reference to claim 55, Charas teaches to use a range of 30 to 300 megahertz for communication between the movable base station and the cable. The lower

limit taught by Charas, therefore, is well below the 300 megahertz recited in claim 56. Accordingly, applicant respectfully submits that Charas does not teach every element of claim 56 and that claim 56 is allowable.

As amended, claim 58 recites a movable base station "wherein the frequency band is a millimeter wave frequency band". Applicant submits that Charas does not teach this element. It is well known in the art that the millimeter wave frequency band is the frequency spectrum from 30 GHz to 300 GHz. Charas specifically teaches to use the 30-300 megahertz frequency band. Accordingly, the millimeter wave frequency band recited in claim 58 is orders of magnitude higher in frequency than the 30 to 300 megahertz spectrum taught by Charas. Applicant respectfully submits that Charas does not teach all of the elements of claim 56 and that claim 56 is allowable.

Regarding claims 57, 59, and 60, these claim depend from claim 54 which applicant respectfully submits is allowable. Accordingly, claims 57, 59, and 60 are at least allowable as depending from an allowable base claim.

The Examiner has rejected claims 30-36,49-54,61,62,89 and 93 under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1,2,5,6 and 8 of US Patent No. 6,026,277. The Examiner also rejected claims 30-36,49-54,61,62,89 and 93 under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1 and 11 of US Patent No. 5,729,826. A terminal disclaimer for each of the patents is submitted with this response. Applicant respectfully submits that the double patenting rejections have been overcome.

Conclusion

In this response, applicant has amended claims 37, 39-43, 45-48, 55, 57-60, 63, 65-69, 75, 77-80, 84, 97, 99-102 and 108. No claims have been cancelled or added. Accordingly, claims 30 -112 remain pending in the application. The applicant is submitting a terminal disclaimer for US Patent No. 6,026,277 and a terminal disclaimer for US Patent No. 5,729,826 with this response.

Respectfully submitted,
CHARLES D. GAVRILOVICH

Date: October 10, 2002 By: _____

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VERSION WITH MARKINGS TO SHOW CHANGES MADE

37. (Amended) An apparatus adapted to move in accordance with a motion of a mobile unit wherein the motion is relative to a fixed radio port, the apparatus comprising:

a receiver adapted to receive a signal transmitted from the fixed radio port within a frequency band [higher than a low frequency radio frequency band] having a lower limit greater than or equal to 300 megahertz; and

a transmitter adapted to transmit a resultant signal within the frequency band to the mobile unit in accordance with the signal transmitted from the fixed radio port.

39. (Amended) An apparatus in accordance with claim [38] 37, wherein the frequency band is an optical frequency band.

40. (Amended) An apparatus in accordance with claim [38] 37, wherein the frequency band is a millimeter wave frequency band.

41. (Amended) An apparatus in accordance with claim 40, wherein the frequency band comprises a frequency spectrum from 50 [GHz] gigahertz to 70 [GHz] gigahertz.

42. (Amended) An apparatus in accordance with claim [41] 40, wherein the frequency band is an oxygen absorption frequency band.

43. (Amended) An apparatus adapted to move in accordance with a motion of a mobile unit wherein the motion is relative to a fixed radio port, the apparatus comprising:

a receiver adapted to receive a signal transmitted from the mobile unit within a frequency band [higher than a low frequency radio frequency band] having a lower limit greater than or equal to 300 megahertz; and

a transmitter adapted to transmit a resultant signal within the frequency band to the fixed radio port in accordance with the signal transmitted from the mobile unit.

45. (Amended) An apparatus in accordance with claim [44] 43, wherein the frequency band is an optical frequency band.

46. (Amended) An apparatus in accordance with claim [44] 43, wherein the frequency band is a millimeter wave frequency band.

47. (Amended) An apparatus in accordance with claim 46, wherein the frequency band comprises a frequency spectrum from 50 [GHz] gigahertz to 70 [GHz] gigahertz.

48. (Amended) An apparatus in accordance with claim [47] 46, wherein the frequency band is an oxygen absorption frequency band.

55. (Amended) A movable base station in accordance with claim 54, wherein the first communication link and the second communication are established within a frequency band [higher than a low frequency radio frequency band] having a lower limit greater than or equal to 300 megahertz.

57. (Amended) A movable base station in accordance with claim [56] 55, wherein the frequency band is an optical frequency band.

58. (Amended) A movable base station in accordance with claim [56] 55, wherein the frequency band is a millimeter wave frequency band.

60. (Amended) A movable base station in accordance with claim [59] 58, wherein the frequency band is an oxygen absorption frequency band.

59. (Amended) A movable base station in accordance with claim 58, wherein the frequency band comprises a frequency spectrum from 50 [GHz] gigahertz to 70 [GHz] gigahertz.

63. (Amended) An apparatus adapted to move in accordance with a movement of mobile unit moving relative to a plurality of fixed radio ports, the apparatus comprising:

a receiver adapted to receive a plurality of signals, each of the plurality of signals transmitted from each of the plurality of fixed radio ports within a frequency band [higher than a

low frequency radio frequency band] having a lower limit greater than or equal to 300 megahertz;

a transmitter adapted to transmit, within the frequency band, a resultant signal to the mobile unit in accordance with at least one of the plurality of signals; and

a processor adapted to maximize an amount of transferred information to the mobile unit by evaluating a quality of each of the plurality of signals transmitted from the plurality of fixed radio ports.

65. (Amended) An apparatus in accordance with claim [64] 63, wherein the frequency band is an optical frequency band.

66. (Amended) An apparatus in accordance with claim [64] 63, wherein the frequency band is a millimeter wave frequency band.

67. (Amended) An apparatus in accordance with claim [65] 66, wherein the frequency band comprises a frequency spectrum from 50 [GHz] gigahertz to 70 [GHz] gigahertz.

68. (Amended) An apparatus in accordance with claim [67] 66, wherein the frequency band is an oxygen absorption frequency band.

69. (Amended) An apparatus in accordance with claim [73] 63, wherein the processor is further adapted to determine a best fixed radio port of the plurality of fixed radio ports, the best fixed radio port enabling the maximization of the amount of transferred information to the mobile unit.

75. (Amended) An apparatus adapted to move in accordance with a movement of a plurality of mobile units moving relative to a plurality of fixed radio ports at a velocity greater than a relative velocity of movement between each of the mobile units of the plurality of mobile units, the apparatus comprising:

a first radio interface adapted to communicate with the plurality of fixed radio ports in a frequency band;

a second radio interface adapted to communicate with the plurality of mobile units in the frequency bandwidth, the frequency band [higher than a low frequency radio frequency band] having a lower limit greater than or equal to 300 megahertz; and

a processor adapted to establish a communication link between the plurality of mobile units and at least one of the plurality of fixed radio ports based on a plurality of signal quality indicators, each of the signal quality indicators corresponding to each of a plurality of transmitted signals transmitted from the plurality of fixed radio ports.

77. (Amended) An apparatus in accordance with claim [76] 75, wherein the frequency band is an optical frequency band.

78. An apparatus in accordance with claim [76] 75, wherein the frequency band is a millimeter wave frequency band.

79. (Amended) An apparatus in accordance with claim 78, wherein the frequency band comprises a frequency spectrum from 50 [GHz] gigahertz to 70 [GHz] gigahertz.

80. (Amended) An apparatus in accordance with claim [79] 78, wherein the frequency band is an oxygen absorption frequency band.

84. (Amended) A communication system adapted to simultaneously provide a communication channel having a data rate of at least 2 megabits per second to each of at least 12 mobile units traveling at a speed greater than 45 kilometers per hour within a geographic area less than 1800 square meters.

97. (Amended) A method of providing a communication link between a communication network and a mobile unit having a motion relative to a plurality of fixed ports, wherein the plurality of fixed ports are communicatively coupled to the communication network, the method comprising the steps of:

moving a movable base station in accordance with the motion of the mobile unit;

receiving a plurality of signals at the movable base station, each of the plurality of signals transmitted from each of the plurality of fixed radio ports within a frequency [bandwidth higher than a low frequency radio frequency bandwidth] band having a lower limit greater than or equal to 300 megahertz;

transmitting, within the frequency band, a resultant signal to the mobile unit in accordance with at least one of the plurality of signals; and

maximizing an amount of transferred information to the mobile unit by evaluating a quality of each of the plurality of signals transmitted from the plurality of fixed radio ports.

99. (Amended) An apparatus in accordance with claim [98] 97, wherein the frequency band is an optical frequency band.

100. (Amended) An apparatus in accordance with claim [98] 97, wherein the frequency band is a millimeter wave frequency band.

101. (Amended) An apparatus in accordance with claim [99] 97, wherein the frequency band comprises a frequency spectrum from 50 [GHz] gigahertz to 70 [GHz] gigahertz.

102. (Amended) An apparatus in accordance with claim [101] 97, wherein the frequency band is an oxygen absorption frequency band.

108. (Amended) A method comprising the step of simultaneously providing a communication channel having a data rate of at least 2 megabits per second to each of at least 12 mobile units traveling at a speed greater than 45 kilometers per hour within a geographic area less than 1800 square meters.